

Performance measurement and management in the public sector: state of the art and research opportunities

Performance
measurement
and
management

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Abstract

Purpose – Since the 1980s, performance measurement and management (PMM) has been described as an essential element of new public management (NPM) reforms. The purpose of this paper is to provide an overview of the current state of the art and future research opportunities for PMM in public sector management.

Design/methodology/approach – The paper carried out a bibliometric literature review using two main techniques named (1) performance analysis and (2) science mapping techniques. It investigated the academic research area describing the main publications' trend, the conceptual structure and its evolution from 1996 to 2019.

Findings – The results highlighted the growing relevance of PMM research in public organisations and confirmed a great interest of the business, management and accounting literature on PMM in public sector management. Furthermore, the results also described a conceptual structure of the public PMM literature analysed and its evolution being too generic to answer public organisations' needs. The results identified five main research gaps and research opportunities.

Originality/value – Although the adoption of rigorous bibliometric techniques was recognised as being useful for assessing the academic research study, the paper describes the business, management and accounting literature contributing to new theoretical and practical future opportunities.

Keywords Public, Performance measurement, Performance management, Literature review, Bibliometric analysis, Science mapping, Performance analysis, New public management (NPM), Balanced scorecard

Paper type Literature review

1. Introduction

Since the 1980s, new public management (NPM) reforms have highlighted the need to improve the efficiencies and efficacy of public organisations through better performance measurement and management (PMM) (Anderson and Klaassen, 2012; Brignall and Modell, 2000; Halachmi, 2011; Hood, 1991, 1995, 2000; Kroll and Moynihan, 2015). As a consequence, countless public organisations have started to experiment with the implementation of performance measurement systems (PMSs) (Arnaboldi *et al.*, 2015; Courty *et al.*, 2005; van Helden and Johnsen, 2002) defined as a balanced and dynamic set of metrics that encompasses the process of setting goals and collecting, analysing and reporting information regarding the performance of actions (Neely *et al.*, 1995). In doing so, public organisations often adopt the most relevant performance measurement models that non-public organisations traditionally use (Speklé and Verbeeten, 2014). The balanced scorecard (BSC) is the most used model, but the performance prism is popular as well (Brodkin, 2008; Modell *et al.*, 2007; Toor and Ogunlana, 2010; Yuan *et al.*, 2009, 2010). These models are appreciated because they favour integrated management between internal and external critical success factors (Bracci *et al.*, 2017; Goh *et al.*, 2015) while simultaneously being able to enable modifications required for environmental factors (Micheli and Kennerley, 2005). However, the design, implementation and use of effective PMSs remain as significant challenges in public organisations as there is heterogeneity amongst them as well



as they are dissimilar to private organisations in terms of both internal structure and external environment (Arnaboldi *et al.*, 2015).

To answer public organisations' specific needs, numerous scholars have highlighted the key role of some performance measurement activities, such as performance monitoring and reporting, to manage performance information effectively (Brusca and Montesinos, 2016; Diggs and Roman, 2012; Kroll, 2015; Moynihan and Lavertu, 2012; Saliterer and Korac, 2013). These performance measurement activities should support overall decision-making processes and favour better transparent internal and external controls that their stakeholders carry out (McDavid and Huse, 2012; Bititci *et al.*, 2011). However, although PMM has been one of the most essential elements of NPM reforms (Arnaboldi and Azzone, 2010; Hood, 1991, 1995), and numerous public organisations have invested in the implementation of PMS (Kravchuk and Schack, 1996), effective PMM in public organisations remains poor, often yielding unsatisfactory results (Agostino *et al.*, 2012; Arnaboldi *et al.*, 2015). Furthermore, the public context's growing complexity is rapidly increasing the challenge to design effective PMSs that can answer public organisations' specific needs (Arnaboldi and Azzone, 2010; Bianchi and Xavier, 2017; Sardi and Sorano, 2019). Recent literature encourages scholars to investigate PPM as a wider issue, considering the public environment's high complexity, and rethink PMM practices through various perspectives (Ammons and Roenigk, 2015; Arnaboldi *et al.*, 2015; Moustaghfir *et al.*, 2016; Latham *et al.*, 2008).

Although there is a great emphasis on PMM in public organisations, the literature rarely investigates the state of the art on PMM in public sector management. In the literature reviews related to this topic, a high focus on performance measurement prevails with particular attention to the understanding of why public managers should measure performance (Behn, 2003; Greiling, 2006). As main contributions, some literature reviews (re)think the managerial purposes to which performance measurement contribute and how these measures could be deployed (Behn, 2003). Other reviews investigate the widespread assumption that management is a key determinant of performance in public administrations (Moynihan and Pandey, 2005). However, no literature reviews developed an effective holistic view that takes a dual approach, equally based on both the performance measurement and performance measurement literature.

This paper aims to provide an overview of the current state of the art of extant research on PMM in the public sector management and highlight possible future research opportunities focussing on business, management and accounting literature. Proceeding from these premises, this study answers an overall research question (RQ): *what are the state of the art and future research opportunities for PMM in public sector management?* Specifically, the paper reviews PMM literature regarding public sector management to answer the following three RQs: (1) *what is the principal publications' trend?*; (2) *what is the conceptual structure?*; (3) *what is the thematic evolution?* Furthermore, the paper aims to discuss the main PMM "topics" according to the analysis carried out.

The paper is organised as follows. The next section describes the methodology chosen to carry out the bibliometric literature review. The third section synthesises the findings that are useful in answering the research questions. The fourth section discusses the results to boost understanding of extant literature related to PMM in the public sector, identifying gaps and future research opportunities. The last section synthesises the paper's main contributions and highlights the need for further research on how to use performance to increase public organisations' efficacy.

2. The methodology

The paper carried out a bibliometric literature review using performance analysis and science mapping techniques. Performance analysis is recognised as being useful for assessing the academic research area describing the progress of science in many different ways. It supports

a rigorous evaluation of principal publications' trends, such as the number of publications, the time distribution of publications and the most prolific authors. Its efficacy is described and confirmed carefully by relevant studies in different research fields, e.g. [Hassini et al. \(2012\)](#), [Pilkington and Liston-Heyes \(1999\)](#) and [Taticchi et al. \(2015\)](#). In turn, the science mapping analysis allows for assessment of the academic research area describing the progress of science through the use of bibliometric performance indicators such as citations, number of documents and *h*-index. Several excellent studies have adopted the science mapping analysis to investigate several different research fields. For instance, [Cobo et al. \(2015\)](#) applied the science mapping technique to analyse the scientific content in the journal *Knowledge-Based Systems*. [Sardi et al. \(2020\)](#) adopted it to study future trends, evolution and future opportunities in big data and performance measurement research. The use of bibliometric indicators supports the design of the conceptual structure and thematic evolution of a research field, i.e. spatial representations of how disciplines, fields and research streams are related to each other ([Cobo et al., 2011](#)). Specifically, the conceptual structure represents the most important research themes dealt with in a research field during an exact period, whereas thematic evolution shows the evolution of a research field over consecutive periods. Each step of the bibliometric literature review is described below briefly.

2.1 Data collection

The first research step identified useful research keywords to carry out the quantitative literature review, i.e. “public”, “performance measurement” and “performance management”. These keywords have been chosen to effectively and widely represent the object of the study: “performance measurement” and “performance management” within the “public” sector management without introducing subjective limits. To avoid the wrong exclusion of papers, in the searching string, we used the keyword “public” without any further specification to include “public sector”, “public management”, “public reform”, “public model”, “public performance”, etc.

Then, as highlighted in [Table 1](#), the search was limited to keywords, articles and journals written in the English language and available on Elsevier’s Scopus. We chose Scopus because it is recognised as “the world’s largest abstract and citation database of peer-reviewed literature and quality Web sources” ([Ballew, 2009](#)). However, we checked the analogies and differences between Scopus and Web of Science (WoS) and we found the following for the topic investigated.

- (1) Almost all the papers identified by WoS were also in Scopus;

Data set	Elsevier’s Scopus
Time	From 1982 (date of the first published paper on Scopus) to 2019
Source type	Journal
Subject area	“Business, Management and Accounting”
Language	English
Keywords	“Public” and (“performance measurement” or “performance management*”)
No. 1: search string of Scopus	(Title-abs-key (“performance management”) or title-abs-key (“performance measurement”) and title-abs-key (public)) and (limit-to (doctype,“ar”)) and (limit-to (subjarea,“BUSI”)) and (limit-to (language,“English”)) and (limit-to (srctype,“j”))
Source: title, abstract and keyword	
This string was performed at December 31, 2019	
No. 2: search string of Scopus	(Key (“performance management”) or key (“performance measurement”) and key (public)) and (limit-to (srctype,“j”)) and (limit-to (doctype,“ar”)) and (limit-to (subjarea,“BUSI”)) and (limit-to (language,“English”))
Source: keyword	
This string was performed at December 31, 2019	

Table 1.
Data collection:
research protocol

- (2) Scopus included a larger number of papers coherent with the identified research study.

These pieces of evidence supported the choices of focus on Scopus.

In selecting the subject area category, the Elsevier classification was used as a reference. In particular, moving from the subject area named “Social Sciences”, this research focusses on the subject area classification named “Business, Management and Accounting” as it is a subset that includes a vast miscellaneous collection of business, management and accounting journals that publish studies on PMM in the public sector. This subject area also included the highly relevant “Public Administration” journals such as *International Journal of Public Administration*, *Public Administration Review*, *The American Review of Public Administration* and *Journal of Public Administration Research and Theory* that published papers on the investigated topic.

Initially, to give a broad overview of the publications’ trends, we focussed the search on titles, abstracts and keywords and we used the string no. 1 in [Table 1](#). This identified 1,046 papers that were used to answer to the first RQ (i.e. (1) *what is the principal publications’ trend?*), and we carried out a bibliometric analysis to give a broad overview of the state of the art of PMM in public sectors management.

Then, to answer to the second and third RQs (i.e. (2) *what is the conceptual structure?*; (3) *what is the thematic evolution?*), we narrowed the search to papers’ keywords using string no. 2 in [Table 1](#) that identified 282 papers. This approach was coherent with the science mapping technique as it roots its analyses on the keywords.

The search identified a data set with 1,046 papers published between 1982 (the year of the first published paper on Scopus) and December 31, 2019. Subsequently, to focus the analysis of the key themes investigated by PMM literature in the public sector further, the search was narrowed to keywords, yielding a smaller data set comprising 282 papers.

2.2 The data analysis

The data sets identified were analysed using bibliometric performance analysis and science mapping techniques [using the strategic diagram ([Callon et al., 1991](#)) as main reference].

The bibliometric performance analysis was carried out by examining the first data set which highlighted different publications’ trends, i.e.

- (1) The number of documents per year ([Figure 2a](#))
- (2) Volume of citations per year ([Figure 2b](#))
- (3) Most prolific authors ([Table 2](#))
- (4) Most relevant journals ([Table 3](#))
- (5) Most relevant countries ([Table 4](#))
- (6) Most relevant keywords ([Table 5](#))
- (7) Most relevant documents ([Table 6](#))

The science mapping technique was applied to the second data set to design the conceptual structure of PMM studies in the public sector and its thematic evolution. Its methodological foundation was co-word analysis, which was rooted in the idea that co-occurrence of keywords describes the content of the documents in a data set ([Callon et al., 1991](#)). Using this approach, the key themes (also called clusters) were identified and grouping of principally similar and closely linked keywords was also performed. The themes included a subgroup of keywords that were linked strongly to each other and were useful for investigating key themes’ constituent parts ([Cobo et al., 2011](#); [Coulter, 1998](#)). To further highlight the evolution of PMM studies, the

conceptual structure and thematic evolution of the scientific research area were investigated by considering three principal periods: 1996–2003; 2004–2011; 2012–2019 [1].

To carry out the science mapping technique, the authors used science mapping analysis tool (SciMAT) software to detect similarities between keywords (Cobo *et al.*, 2011). Using a SciMAT clustering algorithm (Cobo *et al.*, 2015), the principal themes investigated in the study of PMM in the public sector were identified. The outcomes are synthesised in the “strategic diagram” (Figure 3) and in the “evolution map” (Figures 3 and 5) described below.

As shown in Figure 1, the strategic diagram subdivides themes into four groups by considering two dimensions: each theme’s density and centrality (Callon *et al.*, 1991). Density is the cluster’s capacity to maintain itself and develop over time in the field under consideration (Callon *et al.*, 1991). In turn, centrality highlights a theme’s links with other themes. Also, two keywords are considered connected if they are presented in the same documents. The stronger and more numerous these links are, the more a theme designates a set of research problems that the community views as crucial.

To better understand the strategic diagram (Figure 3), a cluster network analysis was adopted to analyse the themes, then the themes with the highest centrality and density, their constituent subthemes and their relationships were synthesised, as given in Figure 4. For example, Figure 3a shows the theme with the highest centrality during the period 1996–2003, i.e. “society and institution”; Figure 4a highlights its constituent subthemes and the depth of their mutual relationships through the thickness of the line connecting the keywords.

The evolution map represents the main changes in the research themes over consecutive years (Figure 5). This map is built using the inclusion index described below (Callon *et al.*, 1991; Cobo *et al.*, 2015) to demonstrate a thematic evolution from theme U (period t) to theme V (period T^{t+1}) if keywords are presented in both associated thematic networks:

$$\text{Inclusion index} = \frac{\#(U \cap V)}{\min(\#U, \#V)}$$

U = represents each detected theme during the subperiod t

V = represents each detected theme during the next subperiod $t + 1$

II	▲ Density	I
Highly developed and isolated themes	Motor themes. Central and developed areas	Centrality ►
Emerging or declining themes	Important but generic and transversal themes	
III		IV

Figure 1.
The strategic diagram
(Callon *et al.*, 1991)

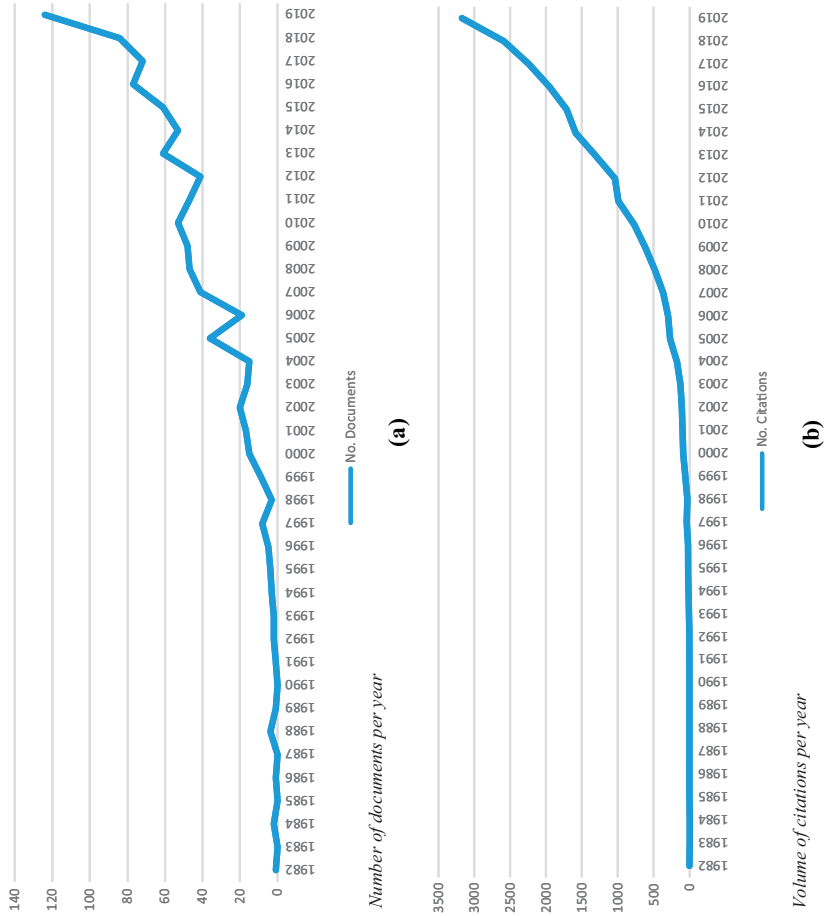


Figure 2.
The number of documents per year and volume of citations per year

Authors	Number	Performance measurement and management
Moynihan, D.P.	11	Table 2. Most relevant publications' trend: most prolific authors
Poister, T.H.	9	
Modell, S.	8	
Laihonen, H.	8	
Jääskeläinen, A.	7	
Arnaboldi, M.	7	
Kroll, A.	7	
Christensen, T.	6	
Bianchi, C.	6	
Hoque, Z.	6	
Læg Reid, P.	6	
Pasha, O.	6	
Agostino, D., Azzone, G., etc.	4	

Journal	Number	
<i>International Journal of Productivity and Performance Management</i>	56	Table 3. Most relevant publications' trend: most relevant journals
<i>International Journal of Public Administration</i>	49	
<i>Public Administration Review</i>	44	
<i>Public Money and Management</i>	43	
<i>Public Management Review</i>	38	
<i>Public Performance and Management Review</i>	31	
<i>The American Review of Public Administration</i>	22	
<i>Journal of Public Administration Research and Theory</i>	20	
<i>Measuring Business Excellence</i>	19	
<i>International Journal of Public Sector Performance Management</i>	17	
<i>Public Personnel Management</i>	16	
<i>Financial Accountability and Management</i>	16	
<i>Evaluation and Program Planning</i>	15	

Country	Number	
The USA	267	Table 4. Most relevant publications' trend: most prolific countries
The United Kingdom	207	
Australia	80	
Italy	76	
Canada	42	
The Netherlands	36	
Finland	33	
Malaysia	31	
Denmark	28	

T^t represents the set of detected themes of the subperiod t , with $U \in T^t$ representing each detected theme during the subperiod t . Let $V \in T^{t+1}$ be each detected theme during the next subperiod $t + 1$. It is said that a thematic evolution exists from theme U to theme V if keywords are presented in both associated thematic networks. Thus, V can be viewed as a theme evolved from U . Moreover, keywords $k \in U \cap V$ are viewed as a “conceptual nexus” graphically represented by a line. Evolutionary bibliometric maps can be built by linking

themes in T^t with themes in T^{t+1} through the “conceptual nexus” (Cobo *et al.*, 2011). As shown in Figure 5, if a nexus exists between two consecutive themes, a line links them. The lines’ thickness is proportional to the strength of the links amongst themes from one period to another. Regarding types of lines, a solid line indicates that the theme maintains the same name during the next period or the theme is incorporated into a theme during the following period (conceptual nexus). However, a dotted line shows that a theme does not maintain the same name and is not incorporated into a theme during the following period (non-conceptual nexus).

3. Findings

The bibliometric performance analysis answers the first RQ and identifies the principal publications’ trend in business, management and accounting literature related to the PMM in the public sector. The analysis highlights an increasing number of papers and volume of citations, especially in the latter 15 years. As shown in Figures 2a and 2b, the number of publications and citations has grown significantly from 1982 to 2019, confirming this area’s growing relevance, particularly during the last investigated years.

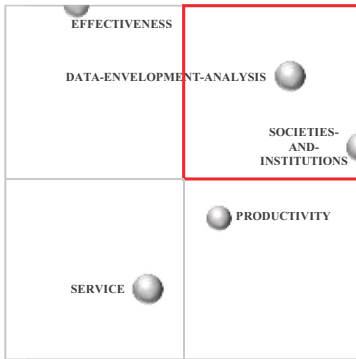
The ranking of the most prolific authors identified these principal scholars: Moynihan, Poister, Modell, Laihonon, Jääskeläinen and Arnaboldi (Table 2). In their most cited paper, Moynihan and Pandey (2010) investigated managers’ use of performance information,

Table 5.
Most relevant
publications’ trend:
most relevant
keywords

Keyword	Number
Performance management	275
Performance measurement	2,256
Public sector	129
Balance scorecard	48
Performance	45
Benchmarking	43
Accountability	41
Performance measures	40
New public management	37

Table 6.
Most relevant
publications’ trend:
most relevant
documents

Authors, year, title and journal of the most citation documents	Number
Eccles, R.G., 1991, The performance measurement manifesto, <i>Harvard Business Review</i>	681
Weaver, G.R., Treviño, L.K., Cochran, P.L. 1999, Integrated and decoupled corporate social performance: management commitments, external pressures, and corporate ethics practices, <i>Academy of Management Journal</i>	465
Christensen, T., Læg Reid, P. 2007, The whole-of-government approach to public sector reform, <i>Public Administration Review</i>	408
De Lancer Julnes, P., Holzer, M. 2001, Promoting the utilization of performance measures in public organizations: an empirical study of factors affecting adoption and implementation, <i>Public Administration Review</i>	365
Brignall, S., Modell, S., 2000, An institutional perspective on performance measurement and management in the ‘new public sector’, <i>Management Accounting Research</i>	356
Head, B.W., Alford, J. 2015, Wicked Problems: implications for Public Policy and Management, <i>Administration and Society</i>	312
McLaughlin, J.A., Jordan, G.B. 1999, Logic models: a tool for telling your program’s performance story, <i>Evaluation and Program Planning</i>	301
Moynihan, D.P. and Pandey, S.K. 2010, The big question for performance management: why do managers use performance information?, <i>Journal of Public Administration Research and Theory</i>	283



Strategic diagram and performance metrics from 1996 to 2003

Name	No. documents	No. citations	H-index
societies-and-institutions	4	122	4
data-envelopment-analysis	4	250	3
effectiveness	2	132	1
productivity	2	4	1
service	3	64	3

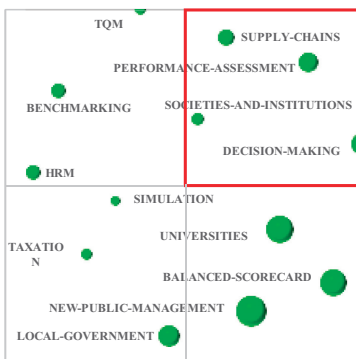
(a)



Strategic diagram and performance metrics from 2004 to 2011

Name	No. documents	No. citations	H-index
organization	7	144	6
performance-assessment	12	426	8
financial-management	17	427	12
societies-and-institutions	12	120	6
balanced-scorecard	23	620	12
private-sector	10	316	7
customer-satisfaction	8	89	5
government	13	279	7
banks	2	58	2
strategic-planning	3	10	2
England	11	143	6
the-Netherlands	3	80	2
accounting	4	71	4

(b)



Strategic diagram and performance metrics from 2012 to 2019

Name	No. documents	No. citations	H-index
performance-assessment	13	32	4
decision-making	16	103	7
universities	26	120	7
new-public-management	32	253	11
supply-chains	9	51	4
balanced-scorecard	24	91	5
benchmarking	7	61	4
human-resource-management	7	12	2
total-quality-management	4	18	2
societies-and-institutions	5	20	3
local-government	16	31	3
simulation	3	14	2
taxation	4	11	2

(c)

Figure 3. The strategic diagram and performance metrics in three different periods

defining this topic as one of the most pressing challenges for scholarship on performance management. Although the governments exerted extraordinary effort in creating performance

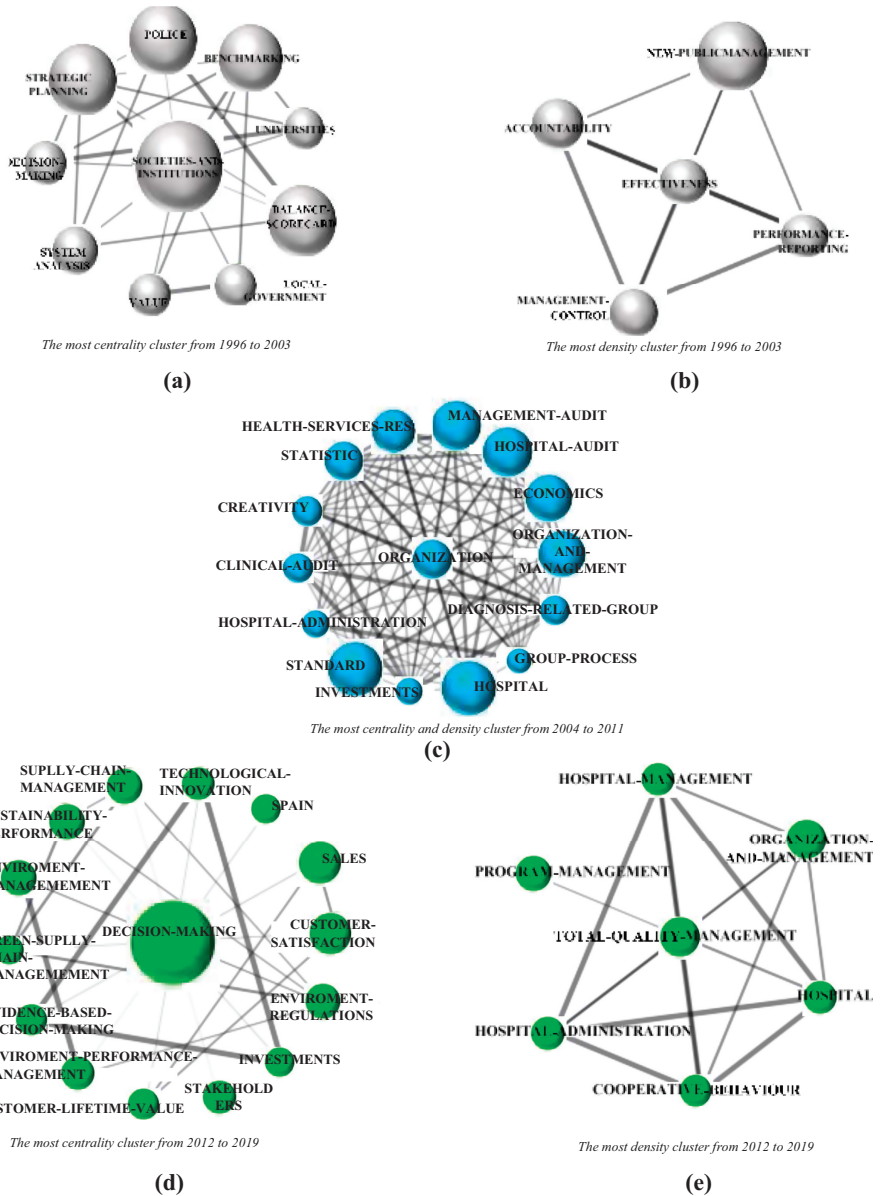
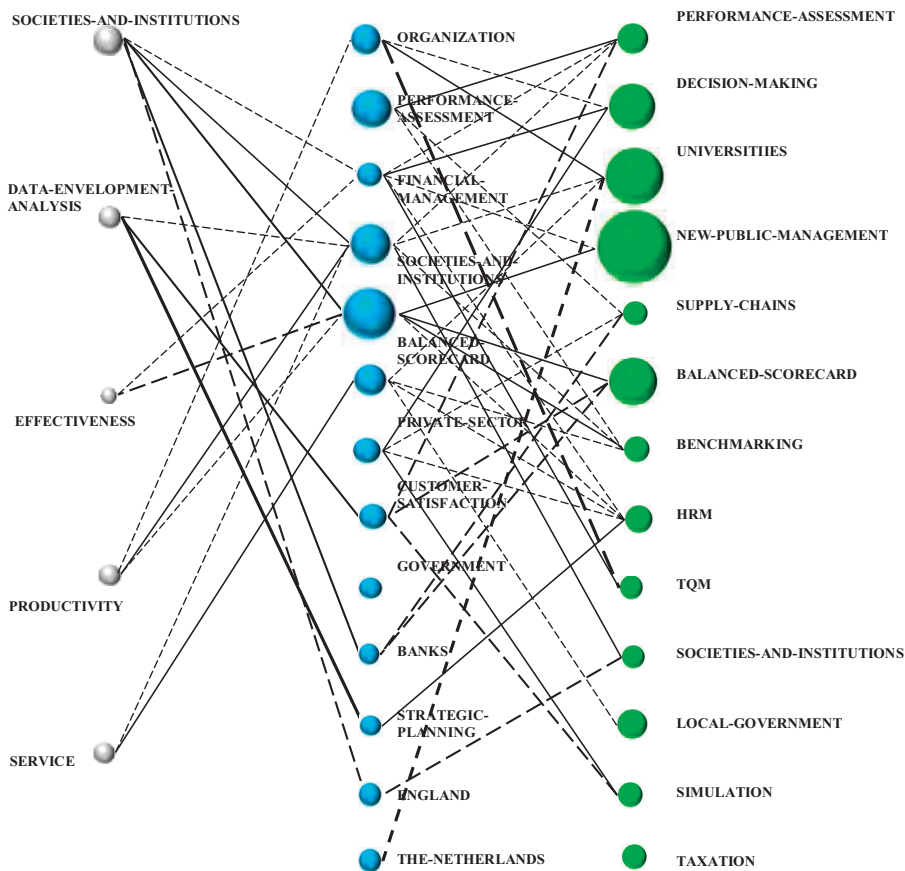


Figure 4. The cluster network analysis of the themes with the highest centrality and density

data, poor attention was paid to the definition of the factors associated with the effective use of performance information. In another key paper, [Moynihan \(2006\)](#) dealt with a US Government case study that embraced the idea of managing for results. This article assessed the implementation of public management reform in the USA and argued that the managing-for-results doctrine had been adopted only partially and that quite often these implementations did not achieve the expected results. Modell studied the decision-making process that senior



Performance measurement and management

Figure 5. The matic evolution of performance measurement and management in public sector management

management exercised in developing multidimensional PMM (Modell, 2001) and the different PMM practices adopted by countries such as the UK and Sweden (Ballantine *et al.*, 1998). Poister (2010) dealt with strategic planning's key future role and the need to manage the adoption of a holistic strategic management approach. He highlighted the need to link the strategic and performance management processes more closely with respect to the past year. Jääskeläinen and Arnaboldi emerged as the two principal scholars on the performance measurement research stream. Jääskeläinen published five papers on PMM in public organisations. Initially, he researched only the measurement of public service organisations' productivity (Jääskeläinen, 2010, 2013; Jääskeläinen and Uusi-Rauv, 2011), then he extended his scope to the PMS design and identified an innovative strategic framework for PMM in the public sector (Jääskeläinen and Laihonen, 2014; Jääskeläinen *et al.*, 2015). Arnaboldi investigated PMM in the Italian public sector to support the shift in public organisations from bureaucratic towards more effective performance-oriented models. She also paid particular attention to the process of translating PMS into operational use in the context of public sector reforms (Arnaboldi and Azzone, 2010) as well as defining the efficacy dimension in PMS for public organisations (Arnaboldi *et al.*, 2015).

The analysis of the journals publishing documents on PMM in public sectors identifies the *International Journal of Productivity and Performance Management* as the most relevant

journal in this area (no. 56), followed by the *International Journal of Public Administration* (no. 49), *Public Administration Review* (no. 44) and *Public Money and Management* (no. 43; Table 3).

The analysis of the number of documents by country shows that the USA, the UK and Italy have the highest number of publications (Table 4). Instead, excluding the keywords searched, the most relevant authors' keywords highlight the key role of the BSC (Carmona and Grönlund, 2003; Jacobs *et al.*, 2018; Maran *et al.*, 2018; Moullin, 2017; Radnor and McGuire, 2004; Suthewasinnon *et al.*, 2016; Wisniewski and Dickson, 2001), performance measures (Carmona and Grönlund, 2003; Gerald, 2009), benchmarking (Ammons, 1999; Ammons and Rivenbark, 2008; Bowerman *et al.*, 2002; Salhieh and Singh, 2003), service delivery through public-private partnerships (Boyer, 2016; Negoita, 2018) and accountability (Bawole and Ibrahim, 2016; Brodtkin, 2008; Diggs and Roman, 2012). The BSC was investigated in relation to the need to create a set of internal and external balanced performance measures (Carmona and Grönlund, 2003) and the need to shed light on how a "new" PMS could be developed (Conaty, 2012; Suthewasinnon *et al.*, 2016) for improved success (Newcomer and Caudle, 2011). Accountability was explored concerning the function of the kind of public organisations (Brodtkin, 2008) and strategies in PMM.

The bibliometric analysis also shows the most relevant documents based on citation volume (Table 6). The most cited paper is "The performance measurement manifesto" (Eccles, 1991), well known as a milestone in PMM research. Eccles highlighted the need to overcome the use of financial indicators, including non-financial measures (such as quality, customers' satisfaction, innovation, market share, etc.), to reflect the organisation's economic condition and growth prospects effectively. In this writing, Eccles referred to both private and public organisations, assuming that the principal PMM changes should involve both organisational types.

Other key documents include the papers, "The whole-of-government approach to public sector reform" (Christensen and Lægveid, 2007) and "Promoting the utilisation of performance measures in public organisations: An empirical study of factors affecting adoption and implementation" (De Lancer and Holzer, 2001). The first paper describes a new approach, known as whole of government (WG) (Christensen and Lægveid, 2007), that has overcome single-purpose organisations resulting from NPM reforms. The second document highlights the lack of PMS adoption in many states and local governments, along with the scant use of these systems to improve decision-making. Moreover, it also describes the main factors that affect the utilisation of performance measurement (such as political and cultural factors) and proposes a PMM model, which includes these factors.

The science mapping analysis answers the second and third RQs and identifies the conceptual structure and thematic evolution of business, management and accounting literature related to PMM in the public sector. To answer these RQs, the findings below describe the conceptual structure through a strategic diagram and the thematic evolution using a conceptual evolution map.

3.1 *The conceptual structure and thematic evolution*

Notwithstanding the scant number of papers published during the first period (1996–2003), the analysis of the conceptual structure highlights two main motor themes, i.e. the "data envelopment analysis" (DEA) and "societies and institutions" (Figure 3a), with the highest number of documents, citations and *h*-index. The motor theme, "data envelopment analysis" includes studies about a mathematical programming approach to provide a relative efficiency assessment for a group of decision-making units with multiple numbers of inputs and outputs mainly belonging to the public health sector (Thanassoulis *et al.*, 1996; Modell, 2001). The motor theme, "societies and institution" has the highest centrality (see Figure 4a), and it focusses on the strategic use of the benchmarking approach (Bowerman *et al.*, 2002; Salhieh

and Singh, 2003) and adoption of strategic planning and BSC in the public sector (Carmona and Grönlund, 2003; Wisniewski and Dickson, 2001), with particular attention paid to university, local government and police forces (Figure 4a). Efficacy is the densest cluster. During these years, scholars started to highlight the limitations of financial metrics in assessing public's performance and the need for non-financial measures appropriate for managing value creation (Carmona and Grönlund, 2003; Hyndman and Eden, 2000; Stainer and Stainer, 2000; Tuck and Zaleski, 1996) (Figure 4b).

During the second period (2004–2011), 13 main research themes were found, with six motor themes (see Figure 3b). “Organisation” is recognised as a key theme, being the most central and developed. During these years, PMM started to be studied by adopting an organisational approach, with particular attention paid to healthcare (Figure 4c). Also, “Balanced Scorecard” and “performance assessment” emerged as essential themes. “Balanced Scorecard” becomes the reference model for the implementation of organisational PMS, favouring productivity, efficacy and improvement in public organisations (Brodkin, 2008; Modell *et al.*, 2007; Radnor and McGuire, 2004; Toor and Ogunlana, 2010; Yuan *et al.*, 2009, 2010). “Performance assessment studies” give relevance to the performance measurement of public projects, introducing specific key performance indicators (KPIs) to improve the transparency of public organisations, service delivery and performance monitoring (Robinson and Scott, 2009). “Financial management” studies go beyond financial issues to investigate the selection of multidimensional performance objectives and KPIs (Yuan *et al.*, 2009), performance objectives from stakeholders' perspective (Yuan *et al.*, 2010) and the relationship between stakeholders and public organisations (Thomas and Poister, 2009).

During the third period (2012–2019), the number of themes remained stable, at 13, although their content, relevance (Figure 3c) and relationships with previous themes changed considerably (Figure 5). The highest number of papers belongs to the themes, “universities”, “new public management” and “balanced scorecard”, but they are not motor clusters and are still poorly developed as they are during the second period. The generic theme “new public management” includes studies on accountability, strategic management and management control. Research on accountability proposes models for a better understanding and tracing of the public procurement process (Diggs and Roman, 2012) as well as performance information used for internal control and external accountability purposes (Moynihan and Lavertu, 2012; Saliterer and Korac, 2013). However, research on strategic management and management control deals with the use of PMS (Speklé and Verbeeten, 2014), internal and external use of performance information and the use of public performance reports (McDavid and Huse, 2012). The clusters with the highest densities are “total quality management” (TQM), which pays particular attention to the adoption of TQM in healthcare in general and hospital management in particular and “project management” (Figure 4e). In turn, the cluster with the highest centrality is “decision making”, which highlights numerous links with themes related to environment and sustainability (e.g. “sustainability performance”, “environment-management”, “green supply chain” and “environment performance measurement system”), stakeholders (e.g. “customer satisfaction” and “customer lifetime value”) and “technological innovation” (Figure 4d).

4. Discussion

As described in the previous section, to answer the first specific RQ, i.e. *what is the main publications' trend?*, the performance analysis highlights the growing relevance of PMM research in public organisations, confirmed by a growing number of journals, authors and countries involved in public PMM studies. The study of the second and third specific RQs showed that the overall conceptual structures of the public PMM literature and their evolution are still *too generic to answer public organisations' needs* (Figure 6).

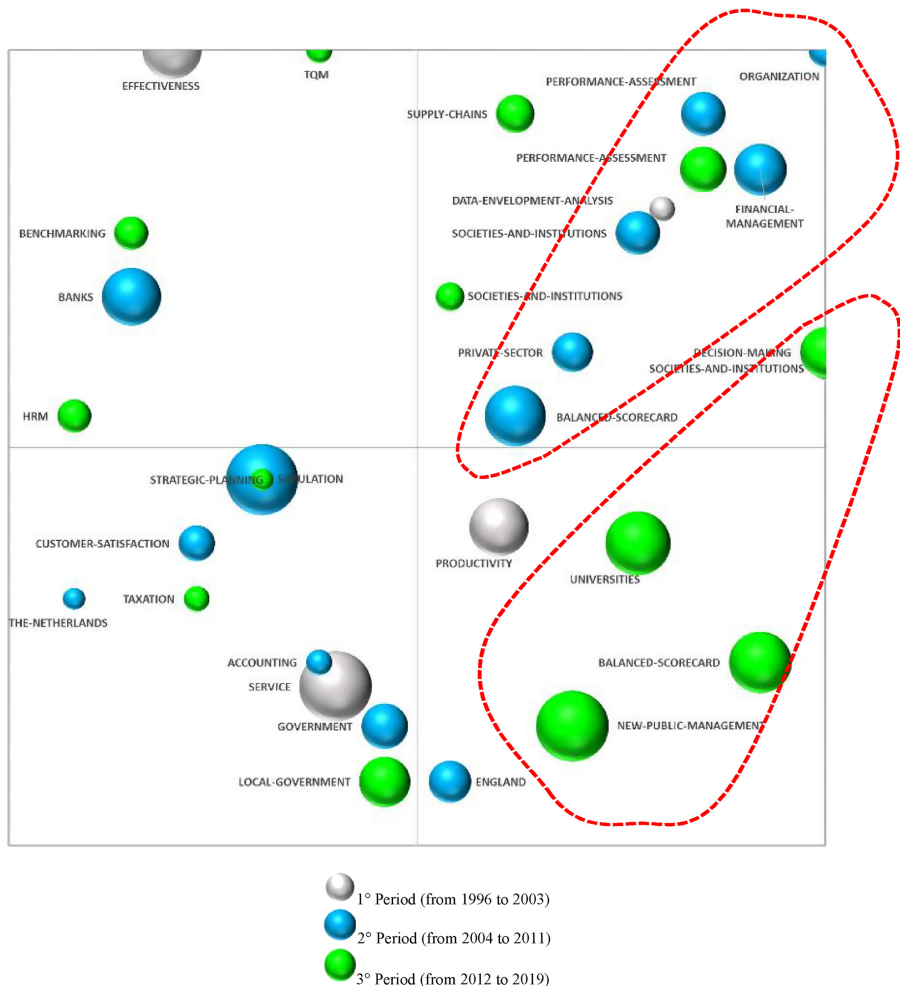


Figure 6.
The strategic diagram
and its evolution

The study outlines a growing trend in the number of thematic areas from the first to the second period and a stable number of thematic areas from the second to the third period. As previously highlighted, during the first period, the initial PMM studies in the public sector focus mainly on the investigation of a few specific issues. A bewildering number of indicators related to “productivity” and “effectiveness” are established for all kinds of activities, often measuring only what can be quantified easily and processed by information systems instead of what is considered strategically relevant (Bellamy and Taylor, 1998). In analysing performance information, a mathematical programming approach prevails for improving the decision-making process, especially in the health-care sector (Thanassoulis *et al.*, 1996), whereas strategic and integrated approaches in PMM rarely are investigated. The second period (2004–2011) shows a significant increase in the number of studied themes, publications and citations that confirm the growing relevance of PMM in the public sector. During this period, the conceptual structure reveals several important motor themes (e.g. organisations, BSC and performance assessment), along with the introduction of new themes

(e.g. strategic planning, customers' satisfaction and accounting; see Figure 6) aligned with NPM reforms. What is surprising is the inversion of the trend in the conceptual structure of the third period: even if the number of themes remains the same, their content changes heavily and their relative importance and interconnection decrease. This highlights a clear lack of focus in PMM research carried out in the public sector over the past few years. As shown in Figure 6, the most investigated and cited themes are transversal and generic ("new public management", "balanced scorecard" and "university"; Figure 3, quadrant II). Few motor themes were found along with a small number of new motor themes (e.g. "supply chains" and "decision making"). Only the "decision making" theme exhibited high relevance and potential to develop further over time. However, public PMM for decision-making was studied, mainly considering the need to account for performance, which arguably went too far (Arnaboldi, 2015), as well as to solve technical issues without considering the effective use of performance information and the people filling out performance data. This means that PMM research in the public sector focusses mainly on generic themes, neglecting the investigation of issues needed to face the specific managerial complexity of public organisations.

Further, the qualitative analysis of the identified literature revealed *five main research gaps and research opportunities*, which are described below:

(1) As described at the beginning of the paper, the rise of the international movement of public sector reforms (Hood, 1991, 2007) determined the growing attention on PMM in the public sector. In the 1990s, the diffusion of NPM reforms is described as essential in favouring the paradigm change from the traditional model of public administration to the public management paradigm. For many years, NPM reforms were the main references of PMM research in the public sector. Without denying the importance of NPM to activate changes, in the past few years, its role has been criticised widely (Christensen and Læg Reid, 2007). Reforms in public administration typically attempt to spread a culture of efficiency, often signalling the proliferation and circulation of notions of performance, transparency, objectives, results, rationalisation, etc. These notions are, indeed, quite hollow before they face practical explication (Muniesa and Linhardt, 2011). Consequently, in the past 15 years, they frequently have been accompanied by the implementation of performance measures whose purpose mainly is to control what the public organisation does, how it does it, how well it does it, how much it does it and for how much money (Hood, 2007; Modell, 2001, 2009; Townley et al., 2003). However, to change the paradigm effectively, research should clarify PMM's role in public organisations and the key determinants of successful PMM in the different contextual factors within which each public organisation operates. To highlight the shortage of NPM, recent research describes NPM as "dead", too vague and generic, and it claims that a new reform trend has surfaced, which is known as post-NPM (Reiter and Klenk, 2019). Even Hood, the inventor of the NPM label, underlined that the term has been overused to the point of concept overstretch (Hood, 2007).

We could conclude that *NPM appears to be a wide umbrella theme, but that further context-specific research and practices should be useful to favour effective PMM in the public sector.*

To support the effective adoption of PMM in public organisations, it should be useful to go beyond the labels and focus research much more on the PMM of effective public organisations to

- (1) identify the best PMM practices suitable for facing the public sector's specific complexities;
- (2) theorise a new, context-specific PMM paradigm in the public sector vs a context-specific approach.

As a consequence, further research is required on PMM in different countries and sectors to highlight specific needs and contingencies useful for defining new models and theories.

(2) In the early years of public reform, the TQM approach was very useful in disseminating the principles of quality and efficiency, along with the need to measure performance in the public organisation (McAdam *et al.*, 2002). This approach favours the diffusion of a strong orientation towards the customer and the positive impact of TQM tools and approaches for organisational improvement (see, for instance, adoption of the business excellence model, International Organization for Standardization [ISO] norms, benchmarking, etc. (McAdam *et al.*, 2002; Bititci *et al.*, 2012). As happens in the private sector Garengo (2009), the adoption of TQM principles initially pulled the implementation of PMSs into public organisations and tried to promote the shift in attention from the study of a single phenomenon and/or indicator to the analysis of the organisation as a whole and integrated system (Büchner *et al.*, 2015; Keeble Ramsay and Armitage, 2010; Salge and Vera, 2009). In the early 2000s, a new approach, known as WG (Christensen and Læg Reid, 2007), was suggested to overcome the structural devolution, disaggregation and single-purpose organisations favoured by NPM reforms. This new approach was more evident in English-speaking countries – such as the United Kingdom, Australia and New Zealand – once seen as the engineer of NPM, but it also appeared in other countries, such as the USA, where it is known as collaborative public management (O’Leary *et al.*, 2006). Countries that joined the NPM movement late, such as the Scandinavian countries, also gradually developed studies on PMM in public sectors. As highlighted in the Findings section, during the second investigated period (2004–2011), the research focus on organisation became the centre of public PMM research (organisation has the highest centrality and the highest linkage intensity with other themes; see Figure 6). During the third period, the public sector further increased its interest in TQM and PMM as an engine of organisational change that could increase service quality and, consequently, stakeholders’ satisfaction (Büchner *et al.*, 2015; Keeble Ramsay and Armitage, 2010; Salge and Vera, 2009). Recently, new organisational quality assessment tools have been developed to create a common assessment framework to measure organisational quality in European countries (Mateos-Ronco and Mezquida, 2018). However, current evidence demonstrates these approaches’ potential inadequacy as being still focussed mainly on measuring performance and almost neglecting performance management of the whole organisation (Andrews *et al.*, 2006; Di Mascio and Natalini, 2013). These approaches seem to be inappropriate in the public sector because they do not fully consider the different complex, volatile and uncertain environments that public organisations must face (Cappelli and Tavis, 2016; Micheli and Mura, 2017; Taylor, 2014).

As described by Bourne *et al.* (2017), such a complex environment requires management as a system of systems, i.e. “an arrangement of independent and interdependent systems that collectively exhibits unique capabilities” (Baldwin *et al.*, 2015, p. 65). The adoption of a TQM approach is not enough to support systematic organisational improvements. As shown in the Findings section, TQM research in public PMM studies has been investigated as an isolated theme, with poor attention paid to the study of the implications for management of human resources (HR), strategic management, process improvement and performance appraisal (Büchner *et al.*, 2015; Keeble Ramsay and Armitage, 2010; Salge and Vera, 2009).

We could conclude that *the current TQM approach is not enough to support the shift in PMM focus from the single managerial process to the whole public organisation*. Further research should be carried out to

- (1) favour the development of an integrated approach to connect the single management process in a holistic system with a strategic purpose;
- (2) generate knowledge on the organisational processes often overlooked by PMM studies but that is essential in the current competitive environment (see, for instance, the management of HR, operations, service, etc.);

- (3) promote the development of a holistic and strategic approach in managing public organisations.

(3) Since the 1900s, adoption of managerial frameworks borrowed from the industrial sector has emerged as the main way to introduce PMM practices in public organisations (Carmona and Grönlund, 2003; Wisniewski and Dickson, 2001). Several research studies have claimed that a need exists to develop a new specific framework to address the complex environment of public organisations (Arnaboldi *et al.*, 2015). However, since the early 2000s, the BSC has emerged as one of the most relevant themes. Plenty of literature reviews have empirically investigated the implementation of BSC in public organisations (Jacobs *et al.*, 2018; Maran *et al.*, 2018). During the final period, the BSC was the most relevant theme (for several documents, citations and *h*-index), and it is often studied in relation to the definition of specific KPIs and the use of benchmarking systems (Wait and Nolte, 2005; Wynn-Williams, 2005). Even if particular attention was paid to the private sector as a reference for NPM reforms (Boyne, 2002), numerous differences between the private and public sectors require the development of a specific PMM framework to answer public organisations' complexities (Bianchi *et al.*, 2010; Bianchi and Xavier, 2017; Micheli and Kennerley, 2005). Moreover, recent evidence highlights that a need exists to move attention away from implantation of technical approach to the definition of a new managerial approach (Birdsall, 2017).

We could conclude that even if *the BSC is the most diffusive PMM framework in the public sector, it is not suitable to address public management's specific needs*. Further research needs to

- (1) identify PMM frameworks that can address public organisations' specific needs and complexities;
- (2) highlight a new PMM approach to manage managerial activities. To overcome the traditional model of public *administration* and adopt the so-called public *management* model, it is also essential to move the focus from performance measurement frameworks and tools to a new managerial approach, with leverage on cultural and behavioural controls.

Empirical studies should be useful in developing additional knowledge of cultural and behavioural routines that explain how organisations adopted the performance measurement. The aim should not be the development of completely innovative PMM frameworks but rather the inclusion of key issues, such as personal traits, people's interactions and implicit levels, such as leadership, democratic culture and participative decisions (Cardinal *et al.*, 2004).

(4) During the second investigated period (2004–2011), strategic planning appeared as a new theme to highlight the need for a strategic approach in PMM in public organisations (Poister, 2010). The use of strategic planning in performance measurement projects became essential in setting organisational goals, as well as motivating, judging and rewarding performance. During these years, the US Government emphasised the relevance of strategic planning and performance measurement, but these implementations often were unsuccessful in implementing reforms that would enhance managerial authority, undermining the logic that promised high-performance improvements (Moynihan, 2006). Poister (2010) outlined the shift in measurement to achieve strategic goals and objectives rather than specific, but unlinked, scopes. However, although important studies outline the key role of a strategic approach and the need to link strategic management closely to performance management processes (Poister, 2010), most of the research studies have yet to address NPM reforms.

As highlighted by Ansoff (1988, p. 235), "strategic planning is focussed on making optimal decision making", while NPM reforms require the adoption of strategic management as it "is

focussed on production (of) strategic results". This means that rather than merely drawing up a plan, it aims to integrate planning with all the other parts of the organisation to address the need for integration (Bianchi and Xavier, 2017).

We could conclude that PMM studies and practices in public organisations require *evolving from isolated strategic planning activities to a whole strategic management approach*. Future theoretical and empirical research is required to identify new PMM models that can

- (1) integrate strategies, goals and results to draw up dynamic reports which are able to support integrated planning;
- (2) support the design of a dynamic PMS that supports planning, controlling and forecasting in public activities.

(5) The PMM literature describes performance appraisal, i.e. "the system whereby an organisation provides employees feedback about their performance and helps the organisation improve individual performance" (DeNisi and Smith, 2014), as one of the most significant factors contributing to the successful outcome of PMM activities in both private and public organisations (Bititci *et al.*, 2012; Hooi, 2019; Moustaghfir *et al.*, 2016; Sardi *et al.*, 2019). Since 2005, Kaplan and Norton underlined that HR investment must be integrated if the organisation aims to realise the full potential of PMM. The alignment and integration of PMM and human resource management (HRM) practices provide the conceptual building blocks for developing objectives for human, information and organisational capitals in the BSC learning and growth perspective. On the heels of English NPM reforms, several studies on HRM practices demonstrate the positive and significant relationship between HRM practices, organisational PMM and public organisations' performance (e.g. Brown, 2004). With NPM reforms, managers are personally accountable for achieving results and consequently, the need to link organisational PMM with "the policies, procedures and processes involved in the management of people in work" (Sisson, 1990, p. 1) becomes essential. Several HRM appraisal systems have been implemented to manage people's behaviour and monitor the achievement of results (Amin *et al.*, 2014). Recent literature highlights the differences between private and public organisations (Blom *et al.*, 2018) and describes some specific characteristics of public organisations that could determine lesser effects of HRM practices on individual performance (e.g. the higher ambiguity of the goal, stricter regulations and the specific work motivation of public sector workers; Brewer and Walker, 2013; Daley and Vasu, 2005). Some scholars suggest that performance measurement can alter public sector authority relations and can have implications regarding how public managers can use performance information strategically to gain acceptance of management authority and organisational change (Nielsen and Jacobsen, 2018). However, notwithstanding recently public PMM research on HRM having gained particular attention (Figure 6), most studies focus on HRM practices, such as performance-based compensation and merit-based promotion, with scant attention paid to the importance of key issues such as leadership, strategic alignment, knowledge sharing, awareness of shared values, etc. (Moustaghfir *et al.*, 2016). Once again, the aim is to favour the introduction of various systems of performance appraisal to ensure everyone's contribution to the realisation of results, almost without considering the integration of HRM with organisational PMM practices and the cultural and behavioural impacts. However, since the introduction of the BSC, HRM has been viewed as one of the most relevant research fields that should complement the PMM process to create valuable, rare, inimitable, non-substitutable capabilities that drive competitive advantage (Kaplan and Norton, 2005). Furthermore, HRM plays a key role in mediating the use of performance measurement.

We could add that *further theoretical and empirical studies are required to understand HRM practices' effective role in public PMM*.

New, future, multidisciplinary research should be useful to

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- (1) develop knowledge on HRM practices' effect on individuals' performance in public organisations;
 - (2) theorise strategic HRM practices' role in public PMM to favour effective performance.

To summarise, overall research opportunities highlight the need to theorise a new paradigm that can address the development of holistic and integrated models rooted in public organisations' culture and behavioural routines. The paradigm should integrate the whole production of strategic results to plan, control and forecast future public scenarios. This all requires strong engagement with the HRM department, considering that recent literature has recognised the key role of the interplay between performance measurement, performance management, employee engagement and performance (Smith and Bititci, 2017).

5. Conclusion

Since the 1980s, NPM has created the general feeling that adopting business-like practices favours organisational efficiency and efficacy (Alford and Hughes, 2008), and consequently, several scholars and practitioners have tried to transfer business performance measurement and management practices to the public sector. Plenty of literature reviews underline that management in the public sector should be transformed from the traditional model of public *administration* to public *management*; however, the debate about how PMM practices favour the public management model remains a developing field.

This literature review states that the PMM practices in public sector are still at an early stage of development. Notwithstanding numerous tools and practices have been adapted from the industrial sector, in the public sector management, the main focus is on measuring the efficiency of isolated processes, without considering a PMS's organisational and strategic dimensions. This result is consistent with the Bititci *et al.*'s (2012) writing that placed the PMM practices in public sector at the earlier stage of "integrated performance measurement" and highlighted that in the last period, public PMM research and practices solved technical issues without considering the effective use of performance information and the people filling out performance data.

As the main contribution to research, this paper identifies five main issues that should be further investigated to effectively promote the development of PMM in public sector management i.e. PMM practices, integration of the organisational processes, design of PMM framework, strategic management approach and HRM practices. The identification of these issues also represents an important contribution to practitioners as in this article they can find an overview of the main organisational areas they should improve for effective organisational development. Finally, the identified areas should also drive policymakers in setting the optimal framework for investments to promote PMM in public sector management. This should answer one of the main goals of NPM reforms and the need to overcome the traditional public administration model.

The authors have identified two main limitations of this study. First, as the aim of this paper was to focus on public management, the "business, management and accounting" was chosen as research area and this could limit the inclusion of some studies derived from different scientific areas. Second, the methodology adopted could be restrictive concerning qualitative evidence. Future empirical studies will be useful in identifying the principal cultural and behavioural routines used in public organisations. These case studies should allow for the comparison, along with different countries, and highlight the best PMM practices. Although these limitations may represent potential weaknesses, the authors believe that these limitations are also this research's strength. Employing only a few limitations favoured a quantitative approach, which is useful for better understanding the overview of the literature and, consequently, the potential areas to develop in future studies.

Furthermore, it helps to identify a wide range of themes useful for the development of a holistic PMM approach to the public sector.

Note

1. The years before 1996 were not included in the analysis because they were under the minimum threshold of articles fixed for the analysed periods. (i.e. five papers)

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